

*With the compliments  
of Edward Atkinson.*

# THE DOMINION OF IRON AND COAL.

WHAT IT STANDS FOR

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# THE DOMINION OF IRON AND COAL.

## WHAT IT STANDS FOR.

By Edward Atkinson.

In dealing with the great commerce of the world certain facts should be noted:

1. The home market in every State or nation is by far the most important, even in respect to the great manufacturing and exporting countries. Domestic consumption and trade must always greatly exceed foreign traffic. But both domestic consumption and foreign trade rest upon coal and iron. Witness the relative unimportance of exports disclosed by the figures even of the principal manufacturing countries—Great Britain, France, Germany, the Netherlands and Belgium—which are the machine-using or manufacturing States of Europe. To them may be added the United States, and we have the great exporting nations listed.

From the latest report by Mr. Frederic Emory, chief of the bureau of foreign commerce, State Department, I have derived the figures from which the following computations are made. It is a case in which per capita estimates will not mislead:

Imports by the United Kingdom of Great Britain and Ireland—amount per head in 1898.....	\$57 00
Imports of France, Germany, Belgium and Netherlands, the latter being mainly ports of entry—imports per capita, 1898.....	35 00
United States.....	8 50

### EXPORTS PER CAPITA.

United Kingdom.....	\$29 00
France, Germany, Belgium and Netherlands.....	30 00
United States.....	17 00

The population of the five manufacturing States of Europe named numbers, in round figures, 147,000,000. They buy from us 87 per cent. of our total export at the rate of \$7.25 per head of their own population. They are dependent upon us in large measure for food, timber and fibers, and may become more or less dependent upon us for coal and iron.

The latest computation of the population of the globe given in the International Geography is 1,507,000,000. Deducting the numbers in the manufacturing States of Europe and the United States combined, 221,000,000, our possible customers in the rest of the world number 1,286,000,000. Their total purchases from us in 1898 were 13 per cent. of our total exports, or at the rate of a fraction over thirteen cents per head. But even this statement does not disclose all the facts.

Canada and Australasia, containing about 10,000,000 people, bought from us in 1898 a little over 8 per cent. of our total export at the rate of \$10 per head of their population. These figures being again deducted disclose that our total sales to Asia, Africa, Polynesia, Central and South America, Mexico and the West Indies were only 5 per cent. of our total export, varying but a fraction from \$60,000,000 for the supply of 1,260,000,000 people at less than five cents per head.

The forces of iron and steel are now penetrating these great areas, and are developing an increased power of purchase. When we cease to try to open the doors of commerce by force, and when we welcome their products in exchange for our own by peaceful methods, who can measure the increased benefit to these non-manufacturing States and to ourselves as well?

It will be observed that even in the United Kingdom, whose people depend more than any other upon foreign commerce, the total import and export can bear but a moderate ratio to what the home trade must of necessity be. We have no exact means of measuring it in figures. In Germany, France and the low countries the ratio of foreign trade to the home traffic is far less, while in this country the export traffic, although a sort of balance-wheel, relieving us from the surplus of our products, bears but a very small ratio to the great volume of the home trade.

We have not the exact data of the imports and exports of all other Continents and States, but the less advanced their inhabitants are in the application of iron and steel or of labor-saving mechanism to the useful arts, the more they depend on their domestic production, and the more is even their own consumption of the necessities and comforts of life limited. Low wages and high labor cost stand in the way of any general abundance.

The total exports from the manufacturing States of the world to the non-machine-using nations of Asia, Africa, South and Central America, Mexico and West Indies do not exceed \$1 per head of the population supplied, their imports from all countries not exceeding \$1.25 per head. It will be manifest that such a supply as can be measured by that sum (\$1.25 per head) would go but a very little way in sustaining even the poorest inhabitants of China, India or South America in their year's wants.

I shall not enter into a discussion of our present methods of attempting to increase our exports, but merely call your attention to the fact that we are now paying extra taxes at the rate of \$2 per head or more, a sum in excess of \$150,000,000 and probably \$200,000,000, for the privilege of killing "niggers" in the Philippine Islands under the pretext of extending our commerce in the East.

2. It will be observed that each of the five countries named as manufacturing States, on which, with the United States added, the rest of the world mainly depends for its supply of manufactured goods, is deficient in one or another of the necessities of life and of the materials for use in the manufacturing arts.

Great Britain is deficient in food, fibers and ores suitable for the manufacture of steel, and in many metals.

Germany is deficient in food, fibers and many metals.

France possesses an abundant supply of food, but is deficient in metals, coal, timber and fibers.

The United States only produce an excess of food, fuel, timber, of all the metals except tin, and of substantially all fibers except wool and silk; wool soon to be yielded in excess of our wants whenever the removal of duties on foreign wool enables our manufacturing industry to go on and prosper by working domestic and foreign wools together on even terms with the England and Germany, or whenever the upland cotton States show sufficient vigor and intelligence to suppress the cur dog and to renovate the exhausted upland cotton fields by alternating sheep and cotton on the same field.



3. It follows from the conditions named that all the principal manufacturing States and countries except the United States are dependent countries, to whose people the export of manufactures is necessary to the supply of the means of living.

4. The foundation of all the manufacturing and mechanic arts rests upon coal and iron, because these are the elements of labor-saving machinery. Water has served a limited use, but cannot be compared with coal as a principal source of energy. Without the energy of coal in making the machinery which is worked by water, the latter would be of little use.

Under these conditions the relative position of the several countries named in respect to the labor cost and quantity of coal produced becomes an element of prime importance.

A recent return to the House of Commons made by the British Board of Trade with the customary thoroughness of that department gives the data for comparison in the subsequent computation.

I shall not confuse your minds with small fractions, but will submit all the data at the rate of two cents to the penny or \$4.80 to the pound sterling, and I shall make no distinction between long tons of 2240 pounds and metric tons of 2204 pounds.

The figures presented are those of 1898, which was a year of normal conditions before the "coal famine" of 1899 had developed in Europe:

#### AVERAGE VALUE OF COAL PER TON AT THE PIT'S MOUTH IN 1898.

United Kingdom.....	6s. 4½d.	\$1 53
Germany .....	7s. 4½d.	1 77
France .....	9s.	2 15
Belgium .....	8s. 9½d.	2 11
United States.....	4s. 5d.	1 06

#### CONSUMPTION OF COAL, 1898.

	Tons.
United States.....	193,497,000
United Kingdom.....	153,798,000
Germany .....	88,141,000
France .....	40,921,000
Belgium .....	17,171,000

#### PERSONS EMPLOYED AND COAL PRODUCT PER HAND IN THE YEAR 1898.

	Persons.	Tons.
United Kingdom.....	693,661	.91
Germany .....	367,695	.269
France .....	145,819	.218
Belgium .....	122,846	.180
United States.....	401,221	.490

#### POPULATION AND PROPORTION OCCUPIED IN THE PRODUCTION OF COAL.

United Kingdom.....	40,560,000	1.71 per 100
Germany .....	54,489,000	.66 per 100
France .....	40,600,000	.36 per 100
Belgium .....	6,669,000	1.84 per 100
United States.....	74,389,000	.54 per 100

The figures for 1899 cannot be exactly given. They were approximately as follows:

	Tons.
United States.....	250,000,000
United Kingdom.....	246,000,000
Germany .....	100,000,000

It will be observed that the product per hand is lessening in Europe, while the labor cost measured by number of hands and wages is increasing. The product per hand in the United States is increasing, and the labor cost is diminishing with the rapid application of labor-saving machinery to mining.

In this connection the relative increase in our production of coal and iron becomes interesting.

The approximate figures have lately been computed:

Articles.	1880. Tons.	1899. Tons.
Coal .....	63,822,830	252,115,387
Iron .....	3,355,191	13,620,703

As yet no permanent substitute for coal and coke has been found for the smelting of iron and steel, the diminishing quantity of natural gas having served only as a small and temporary substitute.

We may now observe that progress in the application of iron and steel to the making of machinery for use in all other manufacturing arts (over 360 in number in this country by the census list) has immediately preceded the expansion of exports of all goods, first in Great Britain, next in Germany and last in the United States. Hence regard must be given to the connection of particular inventions in metallurgy with the several periods of the expansion in exports.

The application of steam-power, the use of coal and coke in iron works, the first invention of the blast furnace and other applications of science were all made in Great Britain between the year 1776 and the year 1825, the more important ones in the latter part of the last century. It will be observed that 1776 was the date of the first publication of Adam Smith's "Wealth of Nations," an event in economic history as important as the application of steam and coal to the art of making iron.

These inventions gave supremacy to Great Britain in all the manufacturing arts, enabling her to take the paramount control of commerce. Great Britain was thus enabled to resist the efforts of Napoleon to break her supremacy. She resisted him by granting subsidies of money to other continental States whose armies were sacrificed, while a relatively small number of British troops were put into the field. Her true power was in the industrial army, which enabled her to derive wealth from the applications of iron and steel and from her resulting manufactures and commerce, while French, Italians, Germans, Spaniards and Austrians who might have become rivals in the arts of peace, were engaged in mutual slaughter which led to a degeneration of which the effects are patent even at the present day.

Without her iron, steel and coal Great Britain could never have established her sea power, to which so much importance is given by the advocates of militarism. True, iron and steel naval machines, in which the admiral is powerless without the engineer, had not then displaced the wooden ships by which the sea power of Great Britain was established. But except for the application of iron, steel and coal, and except for the wealth attained by her commerce, these great fleets could not have existed. It may be a long time before commerce will suppress war, but as I have demonstrated in other papers submitted at this meeting, commerce is now the dominating power. War is becoming as absurd and out of date as it is brutal and demoralizing.

The era from 1800 to 1855 may be called the age of iron, during which term Great Britain held supremacy in all the manufacturing arts. In 1855 the inventions of Bessemer made the beginning of a revolution. These were followed by the inventions of Siemens, and in 1877 by the successful application of the Gilchrist-Thomas or so-called "basic process" to iron ores high in phosphorus. This invention made the high phosphorus ores of Germany, which had been previously al-



most worthless, available for the manufacture of steel. The era from 1855 to 1900 may be named the age of steel.

I now call your attention to what may be only a coincidence in the increase in the relative exports of manufactures with the application of these different inventions in Great Britain,\* Germany and the United States, but which I deem a case of cause and effect. Steam, the blast furnace, the proximity of iron ores and coal gave Great Britain the control in the first half of the present century. With the invention of Bessemer the transfer to this country began, and with that transfer began our increase of exports, proceeding slowly until the tariff on iron and steel had become practically inoperative. The application of the basic process of making steel in Germany was immediately followed by an immense expansion of her exports of all manufactured goods. Do we not find cause and effect in these conditions?

So long as the puddling process was a necessary stage between the pig and the bar the making of iron was in large measure a handicraft, depending upon inherited aptitude, physical strength, and social conditions. These factors were held by Great Britain, whose commerce enabled her to procure food in ample abundance, rendering the competition of her well-fed navies and iron puddlers with the poorly-fed Germans and Belgians a very unequal contest. Until a very recent period women have been worked in iron and coal mines in Germany and Belgium, on the ground that woman power could be expended at less cost than coal. On the other hand, so long as iron was to a large extent a handicraft, the social conditions and better opportunities for more desirable work in the United States kept laborers away from the squalid and arduous conditions of the iron mine and furnace. As Daniel Webster said: "We could not afford to do such work ourselves when what was called foreign pauper labor could do it so well for us."

But we interposed high duties or legal obstructions to the import of the iron products of so-called foreign pauper labor, even after the Bessemer and other inventions had rendered our ultimate supremacy well assured. It therefore happened that between 1880 and 1890, the period of the most rapid application of the inventions of Bessemer, Siemens, Thomas and Gilchrist abroad, our use of the products of these inventions was very much retarded. One invention was taken and applied by what we now call a trust; the other invention was bought and for a time suppressed by the same parties. The duty on pig-iron and on the higher form of iron and steel was so effective from 1880 to 1890 as to have compelled the consumers of iron and steel in this country to pay an excessive price as compared to their competitors in the manufacturing arts in Europe. This excess averaged not less than \$70,000,000 a year on the average of 10,000,000 tons of metal consumed in ten years, 1880 to 1889, inclusive. This tax yielded very little revenue to the government, but it increased the relative cost of all the tools and machinery used in all our factories and workshops, and of every railroad built in this country in ten years by at least \$700,000,000. It also kept down the natural demand of this country upon the iron mines and works of Europe, especially of Great Britain. We were the consumers of 30 per cent. of the iron product of the world, and our free demand would have advanced European prices and wages rapidly. But under the high tariff this tax was applied to building up iron and steel works in this country, the difference or tax for the benefit of our ironmasters paid by consumers in ten

years amounting to not less than \$700,000,000, or more than the entire capital existing in all the iron mines, iron and steel works and furnaces in the United States in 1889. It was during that period that the manufacturers of Germany began to compete with Great Britain. It was not until 1890, when the duties on the imports of iron and steel had become practically inoperative, that we began in our great export of manufactures and in any true competition with the manufacturing States of Europe.

In 1890 it became plain that the tariff on iron and steel in the crude forms had become substantially inoperative. It was then apparent that by the year 1900 the iron and steel works of the world would become incapable of supplying the existing demand, and that the paramount control of those metals would have passed to this country. The scarcity of the ores of Europe from which steel is made by the Bessemer process was impending. The increasing cost of coke and coal in Europe had begun. Those facts were so plain to one who could make any sort of forecast as to have led myself to try to fix the future center of the iron production of the world in an article which was printed in the *Baltimore Manufacturers' Record* of that year. In that article I used these words:

"I may not venture to say in this treatise that the supremacy in this branch of industry has passed away from Great Britain, but the increasing scarcity of her fine ores, the increasing depth of her coal mines, the great heat and difficulty in working them, the near exhaustion and consequent high price of coking coal and the change in the conditions of the workmen in Great Britain may sustain such a conclusion.

"The question is not, however, whether the United States will take away any part of the present iron production from Great Britain. The true question is: Can the iron-producing countries combined readily meet the prospective increase of demand.

"It may be that if the artificial obstructions or duties which are now placed in the way of the import of ores and pig-iron in this country were removed, then our complete supremacy in the production of pig-iron would be finally and permanently established, not by reduction in price in this country, but by bringing up prices and wages in Great Britain permanently to the standard of our own. If my forecast is well grounded, there can be no permanent reduction in price for many years, whatever the temporary fluctuations may be.

"When the disparity due to taxation is removed, and the price of iron is as high in Great Britain as in the United States, the supremacy in the consumption or conversion of iron into steamships, railway bars, heavy machinery, tools and the like may be finally established in the United States. When established within our limits, then the supremacy in the production of the iron itself must go to the point where the facilities for working the mines and the cost of assembling the materials at the furnace are least, because at that point the highest wages can be paid for skilled workmen, accompanied by the lowest cost of production, which will be due to such favorable conditions."

It is somewhat dangerous to indulge in prophecy, but one may sometimes venture on the basis of ascertained facts.

It happens to have fallen to myself to predict the era of cheap cotton by free



labor in a pamphlet under that title of 1861, in which I laid down the whole future of the cottonseed-oil industry.

In a study of the railway service made in 1881, the mileage at the end of 1880 numbering 94,000, it became apparent from the logic of the case that our railway mileage in the year 1900 ought to reach 200,000. Had I fixed that mileage of 200,000 a year later, in 1901, it would have been very exact.

On this development of the railway I predicted an accelerating demand for iron. The figures which I gave in 1890 in connection with the previous quotation led to the following prediction. A summary of these conclusions will make the prospective demand of the world for iron in the year 1900 as follows:

	Tons.
Present production.....	25,000,000
Increased consumption of the United States.....	7,000,000
In Great Britain, France, Germany and Belgium.....	2,000,000
In the rest of the world, of course subject to supply from the foregoing countries named.....	6,000,000
Total increase of demand.....	15,000,000
Total supply which will be required for the year 1900.....	40,000,000

I then assigned to the United States as their proportion of that prospective product 14,000,000 tons for the present year. It will probably be exceeded in some slight measure.

The domestic consumption of iron in the United States in 1899 was approximately 375 pounds per head. In 1900 it will probably exceed 400 pounds, subject to rapid increase year by year. The increasing demand will consist—

1. In the construction of about 100,000 miles of railway before the year 1915.
2. For building and construction.
3. For the electric railway system, of which no measure can yet be computed.
4. For the increased use of iron and steel in all arts which follows the extension of the railway.

5. In shipbuilding when the supremacy of this country is established and the obstruction of our present navigation laws is removed.

Doubtless the prices of iron and steel have lately been pushed higher than normal conditions will sustain, but at the lessened prices, which will still yield very large profits, we may soon witness an active demand resumed, while at the lessened prices the opportunity for export will be increased.

It may not be judicious to forecast this increasing demand. During the next ten years, however, the average increase in our population will exceed 2,000,000 a year. At 400 pounds per head, 400,000 net tons per year additional will be called for at the present rates of consumption. If the law of accelerating consumption continues in the future as it has in the past, coupled with heavy and increasing exports, it is doubtful if an average increase of 1,000,000 tons of iron per annum in this country for the next ten years will suffice to supply the demand.

In 1890 I attempted to fix the situs of the center of iron production, putting it at the Great Smoky mountain in Western North Carolina, a little too far south. At that date the imperial deposits of iron and coal in the South had become well known, but the vast deposits of Bessemer ores around Lake Superior had attracted but little attention. The development of these ores has established the center of the iron production a little further north—the Bessemer process at Pittsburg, the

basic process in Alabama, but what the future development of the South may be time will tell.

It matters not whether the supremacy has come to us by means of protection or in spite of it. That would be a mere academic question. Suffice it that our vast superiority in the supply of coal and iron ore and our lead in the application of science and invention to labor-saving mechanism has developed the lowest cost of production that can be found, from which are derived the highest rates of wages and the best conditions of life that can be enjoyed in the conduct of these arts anywhere in the world. We have attained dominion over the imperial metals—iron, steel and copper.

I have placed these facts before you merely for the purpose of putting a few questions, in the hope that some of the economic students who have more time than I have for study, and who have not been subjected to seventy-three attacks of aetatis, may take the matter up in response to the following queries:

1. Did the supremacy in commerce in the latter part of the eighteenth and the early part of the nineteenth century vest in Great Britain because of her paramount control of the supply of coal and iron?

2. Did the inventions of Bessemér, Siemens, Gilchrist, Thomas and others constitute the forces which enabled France, Germany and Belgium to take over an increasing share or proportion in the increasing commerce of the world?

3. Does the paramount control of the production of iron, steel and copper at the highest rates of wages and lowest cost vest in the United States' supremacy in all the manufactures of useful articles in which those are the basic metals?

4. Does not the principal obstruction to the increase of our exports now consist in the duties upon imports, especially of the articles of foreign origin which are necessary in the processes of domestic industry, and which are and must continue to be the principal means of payment for our goods on the part of the non-manufacturing countries and continents in which we are hoping for a great increase of demand?

5. I will put a question which I have not developed in the previous treatise: Are there at the present time more than 4 or 5 per cent. of the persons occupied for gain in the United States who are engaged in any art or manufacture of which a product of like kind could be imported from any foreign country? This question covers both agriculture, manufactures and mining.

6. Are there not twice the number of persons who are occupied for gain, the demand for whose products depends upon exports, as compared to the number engaged in arts of which a foreign product of like kind could be imported?

7. Are not at least 85 per cent. of all who are occupied for gain without any direct interest in imports or exports being engaged in the arts of production and distribution, manufactures and agriculture, which exist of necessity within the limits of our own country, making our home market the most extensive?

8. In what way should our fiscal policy be changed and our revenue collected in order to promote domestic industry and foreign commerce alike?

Finally, the logic of the case in respect to iron and steel leads to such visionary figures in respect to the future demand for iron that it is safer to put the case in the form of questions rather than to make predictions.

I have stated that the extension of the railway service of this country will probably carry the mileage from 200,000 to 300,000 in the next fifteen years. We have,



it is true, a sufficient number of through lines from east to west, but the connecting lines and the necessary increase in the railway service of the South and Southwest, especially in Texas, cannot fail to carry construction nearly, if not quite, to an average of 10,000 miles a year from 1901 to 1910, inclusive. How much the development of electric tramways will be no man can tell. If we compute the lighter demands of tramways and add that to the extension of the regular railway service, can the two combined be less than equal to an average of 10,000 miles of regular railway a year? Every mile requires a hundred tons of iron and steel for its tracks and equipment, and that means a demand in addition to the present demand of 1,000,000 tons of iron a year for the extension of the railway service only.

Again, if the logic of events justified the prediction made in 1890 of an increase in the world's demand for iron from 25,000,000 tons to 40,000,000 tons in the year 1900, will not the demand in 1910 require a supply of at least 55,000,000 tons, probably 60,000,000?

If the consumption of iron per capita in this country increased as it has from 200 pounds per head in 1880 to 300 pounds per head in 1890 and to 400 pounds per head in 1900, will not the same logic of events require 500 pounds per head in 1910, when our population will exceed 90,000,000, domestic consumption calling for over 22,000,000 tons of iron? But the increased dependence upon other countries will make that supply insufficient. If the world's demand for iron in 1910 will surely require a supply of 55,000,000, and probably 60,000,000 tons, from what deposits of iron ores and coal will the increased supply be derived? In view of the present conditions of Europe, can any considerable proportion of the increase be derived from the mines and works of Great Britain, Spain, Sweden, Belgium and Germany? Can the ores and coal which are known to exist in China and in Africa begin to meet the increasing demands of China and Africa in the next ten years? Can Russia supply her own increasing demands? If not, who will make 60,000,000 tons of iron ten years hence, and in what proportions?

In 1878 the proportions of the total commercial product were:

	Per cent.
Great Britain.....	45.20
United States.....	16.30
Germany and Belgium.....	15.21
France.....	10.04

In 1889 the proportions were:

	Per cent.
Great Britain.....	33.16
United States.....	30.57
Germany and Belgium.....	17.64
France.....	06.93

Will it be possible for the world to get a supply of 55,000,000 tons ten years hence without at least 50 per cent. being derived from the mines and works of this country?

Then is not the problem now presented to the people of this country soon to become urgent, how to double the present product of iron and steel by carrying it from 14,000,000 tons in the present year to at least 28,000,000 tons in the year 1910, of which not less than 22,000,000 tons will be required for domestic consumption?

With these somewhat startling questions I leave the subject to the logic of events.

# A FORECAST OF THE WORLD'S IRON AND STEEL TRADE.

[Editorial from MANUFACTURERS' RECORD, of June 28, 1900]

Ten years ago Edward Atkinson contributed to the Manufacturers' Record a very comprehensive paper forecasting the development of the iron interests of the world. Mr. Atkinson pointed out that the accelerating rate of consumption of iron throughout the world indicated that in 1900 the total consumptive requirements of the world would demand 40,000,000 tons of pig-iron, of which he estimated that the United States would have to furnish about 14,000,000 tons. In this week's issue we publish another elaborate paper by Mr. Atkinson, in which the fulfillment of his predictions of ten years ago is pointed out and a forecast of the coming ten given. The domestic consumption of iron in the United States in 1899 is estimated by Mr. Atkinson at 375 pounds, and the consumption for 1900 at 400 pounds per capita. Appreciating the danger of indulging in prophecy, Mr. Atkinson does not undertake to make definite predictions, but lays down now some striking suggestions regarding the possible consumption of iron in 1910.

The increasing demand, according to Mr. Atkinson, will come from the construction of about 100,000 miles of railway during the next fifteen years, from housebuilding and construction, from the extension of the electric railway system, of which no measure can yet be computed; from the increased use of iron and steel in all arts which follow the extension of the railway, and in shipbuilding when the supremacy of

this country in that has been established. "The prices of iron," says Mr. Atkinson, "have doubtless lately been pushed higher than normal conditions will sustain, but at the lessened prices, which will still yield very large profits, we may soon witness an active demand resumed, while at the lessened prices the opportunity for export will be increased. During the next ten years, with an average increase in population exceeding 2,000,000 a year, at 400 pounds per head there will be an increased consumption of 400,000 net tons a year, and if the law accelerating consumption continues in the future as it has in the past, coupled with heavy and increasing exports, it is doubtful if an average increase of 1,000,000 tons per annum in this country for the next ten years will suffice to supply the demand."

Referring to his estimate of 100,000 miles of new railroad construction in the next fifteen years, Mr. Atkinson says:

We have, it is true, a sufficient number of through lines from east to west, but the connecting lines and the necessary increase in the railway service of the South and Southwest, especially in Texas, cannot fail to carry construction nearly, if not quite, to an average of 10,000 miles a year from 1901 to 1910, inclusive. How much the development of electric tramways will be no man can tell. If we compute the lighter demands of tramways and add it to the extension of the regular railway service, can the two combined be less than equal to an average of 10,000 miles of regular railways a year? Every mile requires 100 tons of iron and steel for its track and equipment, and it means a



demand, in addition to the present demand, of 1,000,000 tons of iron a year for the extension of the railway service only.

Again, if the logic of events justified the prediction made in 1890 of an increase in the world's demand for iron from 25,000,000 tons to 40,000,000 tons by 1900, will not the demand in 1910 require a supply of at least 55,000,000 tons, probably 60,000,000?

If the consumption of iron per capita in this country increased, as it has, from 200 pounds per head in 1880 to 300 pounds per head in 1890 and to 400 pounds per head in 1900, will not the same logic of events require 500 pounds per head in 1910, when our population will exceed 90,000,000, domestic consumption calling for over 22,000,000 tons of iron? But the increased dependence of other countries will make that supply insufficient. If the world's demand for iron in 1910 will surely require a supply of 55,000,000 and probably 60,000,000 tons, from what deposits of iron ores and coal will the increased supply be derived? In view of the present conditions of Europe, can any considerable proportion of the increase be derived from the mines and works of Great Britain, Spain, Sweden, Belgium and Germany? Can the ores and coal which are known to exist in China and in Africa begin to meet the increasing demands of China and Africa in the next ten years? Can Russia supply her own increasing demands? If not, who will make 60,000,000 tons of iron ten years hence, and in what proportion?

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With these somewhat startling questions I leave the subject to the logic of events.

These startling figures and questions presented by Mr. Atkinson are exceedingly timely, in view of the pessimistic feeling which has recently swept over the country by reason of a temporary halt in the iron trade. The Manufacturers' Record by no means agrees with all of Mr. Atkinson's economic theories, and it strongly condemns his anti-expansion efforts. But few men of this day have foreseen more clearly than he coming industrial manifestations or have explained them more lucidly. Studying these figures in the light of the past, there is every reason for believing that the marvelous progress in iron production and consumption which he indicates will be fully realized during the next decade. In view of these facts, how insignificant is the temporary lull in the consumptive demand for iron and steel, for as surely as day succeeds night must there come an increasing demand for iron and steel which shall tax our abilities to produce. The world is hungry for iron, coal and steel, and, though it may not year in and year out digest with the same avidity, its appetite is never appeased, and steadily expands from year to year, and ten years hence it may consume, as Mr. Atkinson indicates, at least 55,000,000 tons of pig-iron, or possibly 60,000,000 tons. In these facts of world-wide interest there is found a basis to justify the continued profitable expansion of the iron and steel interests of our whole country, North, West and South.

The MANUFACTURERS' RECORD, as "the most widely quoted industrial paper of America," should be read by all business men who seek to keep posted about the industrial advancement of this country.





